

## EXPLORATION OF THE SATURNIAN SYSTEM WITH CASSINI RADIO SCIENCE

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The ongoing Galileo mission has provided many new insights into the Jovian system. Among them are new discoveries from the Radio Science investigations, including multiple measurements of the Jovian ionosphere, the ionospheres and plasma environments of Io, Europa, Ganymede, and Callisto, and the internal structure of the Galilean satellites.

The Cassini spacecraft, which will be placed in orbit about Saturn in 2004, will conduct Radio Science investigations of many aspects of the Saturnian system with a radio instrument of unprecedented stability and versatility. It will use radio links at three wavelengths: S-band (13 cm), X-band (3.5 cm), and Ka-band (1 cm) to probe the atmospheres and ionospheres of Saturn and Titan and Saturn's rings by means of radio occultations, and to measure the masses and gravity fields of Saturn, Titan, and selected icy satellites by precision tracking. In addition, the stability of the radio instrument will be utilized to conduct a search for gravitational waves during solar oppositions, and to precisely measure general relativistic effects during solar conjunctions during the interplanetary cruise prior to arrival at Saturn.

### **Invited Paper**

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